REMARKS

Claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,533,078 to Christiansen et al. (hereinafter "Christiansen") either alone or in view of U.S. Patent No. 4,420,458 to Dunlap et al. (hereinafter "Dunlap").

Claims 24, 26 to 33, 35 to 37, 39 to 41, 44 to 45 and 48 are hereby amended.

Reconsideration of the application based on claim amendments and the following remarks is respectfully requested.

Interview Summary

Applicants' representative Danielle Sullivan (Reg. 64,125) and Examiner Palabrica conducted a telephonic interview on January 5, 2010, and applicants' representative thanks Examiner Palabrica for his careful analysis and comments. The language of claim 24 was discussed regarding the "at least some of the fuel rods and/or at least some of the guide tubes." Examiner Palabrica suggested amending the claim to recite "all" or "substantially all" and eliminate the guide tubes from the claim language. The applicants' representative and Examiner Palabrica also discussed the water tubes of prior art Dunlap. No agreement was reached.

Applicants' representative Danielle Sullivan (Reg. 64,125) and Examiner Palabrica conducted a telephonic interview on February 1, 2010, and applicants' representative again thanks Examiner Palabrica for his careful analysis and comments. Applicants' representative suggested amending claim 24 to read "a majority of the fuel rods," in reference to the previous discussion regarding the §112 rejections. Examiner Palabrica agreed this was acceptable. Applicants' representative and Examiner Palabrica again discussed the §103 rejection regarding the prior art water tubes of Dunlap. No agreement was reached regarding

this reference. Examiner Palabrica suggested submitting arguments in the response to the Office Action and he will review them.

35 U.S.C. §112 Rejections

Claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement.

The Office Action asserts that in claims 24 and 36 the "at least some of the fuel rods and/or at least some of the guide tubes," has neither an adequate description nor an enabling disclosure.

Claims 24 and 36 have been amended in response to the Office Action to recite the claim amendments proposed in the February 1, 2010, telephonic interview.

Withdrawal of the rejection of claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 under 35 U.S.C. §112, first paragraph, is respectfully requested.

Claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Office Action asserts the claims are vague and indefinite and the limitation "end-piece" has insufficient antecedent basis.

Claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40 and 48 have been amended to correct the antecedent basis.

Withdrawal of the rejection to claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 under 35 U.S.C. §112, second paragraph, is respectfully requested.

35 U.S.C. §103(a) Rejections

Claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 were rejected under 35 U.S.C. §103(a) as being unpatentable over Christiansen either alone or in view of Dunlap.

Christiansen discloses a "pressurized water reactor nuclear fuel assembly 10 comprising a lower tie plate 12, guide tubes 14, fuel rods 18, which are spaced radially and

supported by spacer grids 16a, 16b, 16c, 16d, 16e, and 16f which are spaced along the guide tubes, instrumentation tube 28, and upper tie plate 37 attached to the upper ends of the guide tubes." (Col. 2, lines 61 to 67).

Dunlap discloses a nuclear fuel assembly with a coolant conducting tube. "A spacer retaining water tube arrangement having ...[the] upper end plug shank of the water tube is lengthened sufficiently to prevent its disengagement from its support cavity in the upper tie plate under any anticipated operating condition. The lower end plug shank is similarly lengthened to prevent its disengagement from its support cavity in the lower tie plate." (Col. 2, lines 46 to 53). Such disengagement could occur since the axial growth (elongation) under irradiation is greater for the fuel rods which are supported between the upper and lower tie plates than for the water tube (Col. 2, lines 11 to 17 and Col. 4, lines 42 to 54). Therefore the axial spacing of the upper and lower tie plates could become large enough to disengage the water tube from the tie plates.

Claims 24 and 36 have been amended to recite in part "noses for orientating flow of a coolant fluid of the reactor along lower ends of the fuel rods, the noses being arranged in the nodes of the substantially regular network in order to be positioned in a longitudinal continuation of at least a majority of the fuel rods," and "wherein the noses project from the bottom side of the lower terminal end-piece and converge to be narrower than the diameter of the fuel rods in a direction that is orientated from the top side of the lower terminal end-piece towards the bottom side of the lower terminal end-piece."

Christiansen fails to teach or show noses on "at least a majority of the fuel rods" and "wherein the noses project from the bottom side of the lower terminal end piece and converge to be narrower than the diameter of the fuel rods in a direction that is orientated from the top side of the lower terminal end-piece towards the bottom side of the lower terminal end-piece," as recited in claims 24 and 36. Figure 5 of Christiansen in fact shows the vertical extensions of support housing 50 converging toward the fuel rods. (See also Fig. 6). This is the exact opposite of the present invention as claimed. Therefore, even if it were obvious to have used the fuel rod housing of Christiansen in the lower terminal end-piece as asserted in the Office Action, all of the claim limitations of claims 24 and 36 are not met. Therefore

withdrawal of the rejection of claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 under 35 U.S.C. §103(a) as being unpatentable over Christiansen alone, is respectfully requested.

Dunlap also fails to teach or show noses on "at least a majority of the fuel rods" and "wherein the noses project from the bottom side of the lower terminal end-piece and converge to be narrower than the diameter of the fuel rods in a direction that is orientated from the top side of the lower terminal end piece towards the bottom side of the lower terminal end piece," as recited in claims 24 and 36. The Office Action cites to the lengthened shank of the water tube in Dunlap, shown in Fig. 5. However, the water tube is not a fuel rod as recited in the claims. Furthermore, there is no reason or motivation for one of skill in the art to modify the structure of Christiansen with the single water tube of Dunlap to provide "noses for orientating flow of a coolant fluid of the reactor along lower ends of the fuel rods, the noses being arranged in the nodes of the substantially regular network in order to be positioned in a longitudinal continuation of at least a majority of the fuel rods" as claimed. The lengthened shank of the water tube in Dunlap is part of the water rod and is to "prevent its disengagement from it[s] support cavity in the lower tie plate." (Col. 2, lines 51 to 53. See also, col. 5, lines 26 to 29). This disengagement risk is connected to the lower axial growth under irradiation of the water tube when compared to the fuel rods. The axial growth of the fuel rods being greater, there is no risk of disengagement of the fuel rods from the lower tie plate (see e.g. Fig. 2 and 3 of Dunlap) and no reason at all to provide any fuel rod with a lengthened shank as suggested by the Examiner.

Furthermore, even if it were obvious to modify Christiansen with the lengthened end plug shank of Dunlap (which it is respectfully submitted it is not) there is no reason or motivation to place the lengthened shank to form noses for "at least majority of the fuel rods." Dunlap provides only one lengthened shank configuration in the entire fuel assembly and there is no reason or motivation for one of skill in the art to apply this to "at least a majority of the fuel rods."

Withdrawal of the rejection to claims 24, 26 to 28, 30 to 33, 35 to 37, 39, 40, 47 and 48 under 35 U.S.C. §103(a) as being unpatentable over Christiansen in view of Dunlap is respectfully requested.

CONCLUSION

It is respectfully submitted that the application is in condition for allowance and applicants respectfully request such action.

If any additional fees are deemed to be due at this time, the Assistant Commissioner is authorized to charge payment of the same to Deposit Account No. 50-0552.

Respectfully submitted,
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